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United States Patent [19]

Hyatt, Jr.

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[45] **Date of Patent: Jun. 7, 1994**

[54] **SECURITY SYSTEM WITH SECURITY ACCESS DATABASE DISTRIBUTED AMONG INDIVIDUAL ACCESS DEVICES**

[75] Inventor: **Richard G. Hyatt, Jr.**, Salem, Va.

[73] Assignee: **Medeco Security Locks, Inc.**, Salem, Va.

[21] Appl. No.: **961,025**

[22] Filed: **Oct. 14, 1992**

Related U.S. Application Data

[63] Continuation of Ser. No. 537,724, Jun. 14, 1990, abandoned.

[51] **Int. Cl.**[5] **G06F 7/04**; E05B 45/06; G06K 7/01

[52] **U.S. Cl.** **340/825.31**; 340/825.32; 340/825.34; 340/542; 235/382.5

[58] **Field of Search** 340/825.19, 825.3, 825.31, 340/825.32, 825.33, 825.34, 542; 235/382.5; 70/268, 274, 283

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Primary Examiner—Donald J. Yusko
Assistant Examiner—Mark H. Rinehart
Attorney, Agent, or Firm—Rothwell, Figg, Ernst & Kurz

[57] **ABSTRACT**

An electronic security system includes a controller for controlling access to a location through activation of a lock mechanism in response to coded data and command instructions read from a key or card containing an electronic memory. The key memory data includes information specific to the keyholder which is decoded and acted upon by the controller. The controller memory can be reduced in size while still allowing the use of a large number of keys, by distributing a larger amount of data to the key memories. The controller is also capable of writing and altering key memory data in real time to control the subsequent use of the key.

16 Claims, 10 Drawing Sheets

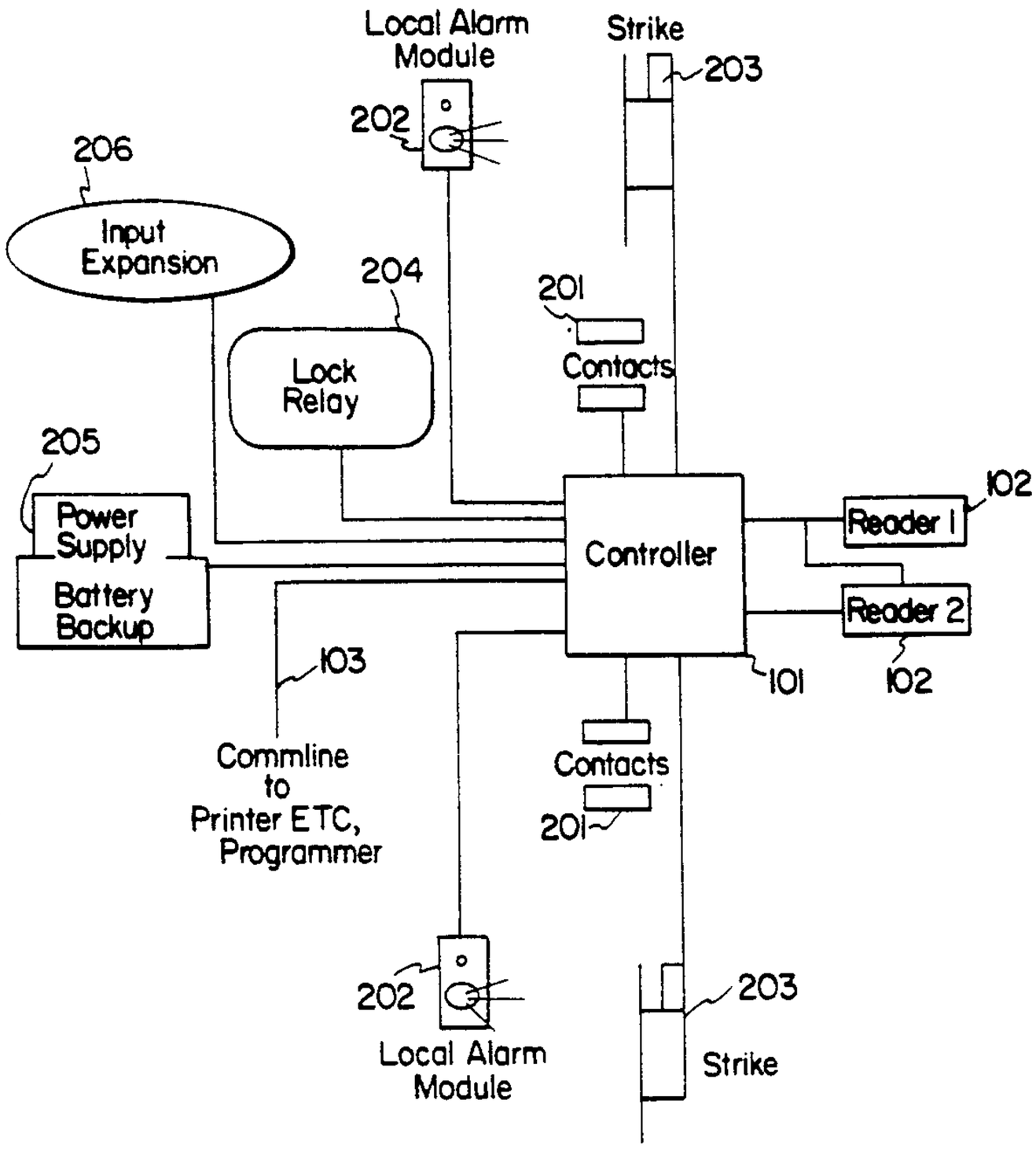


FIG. 1

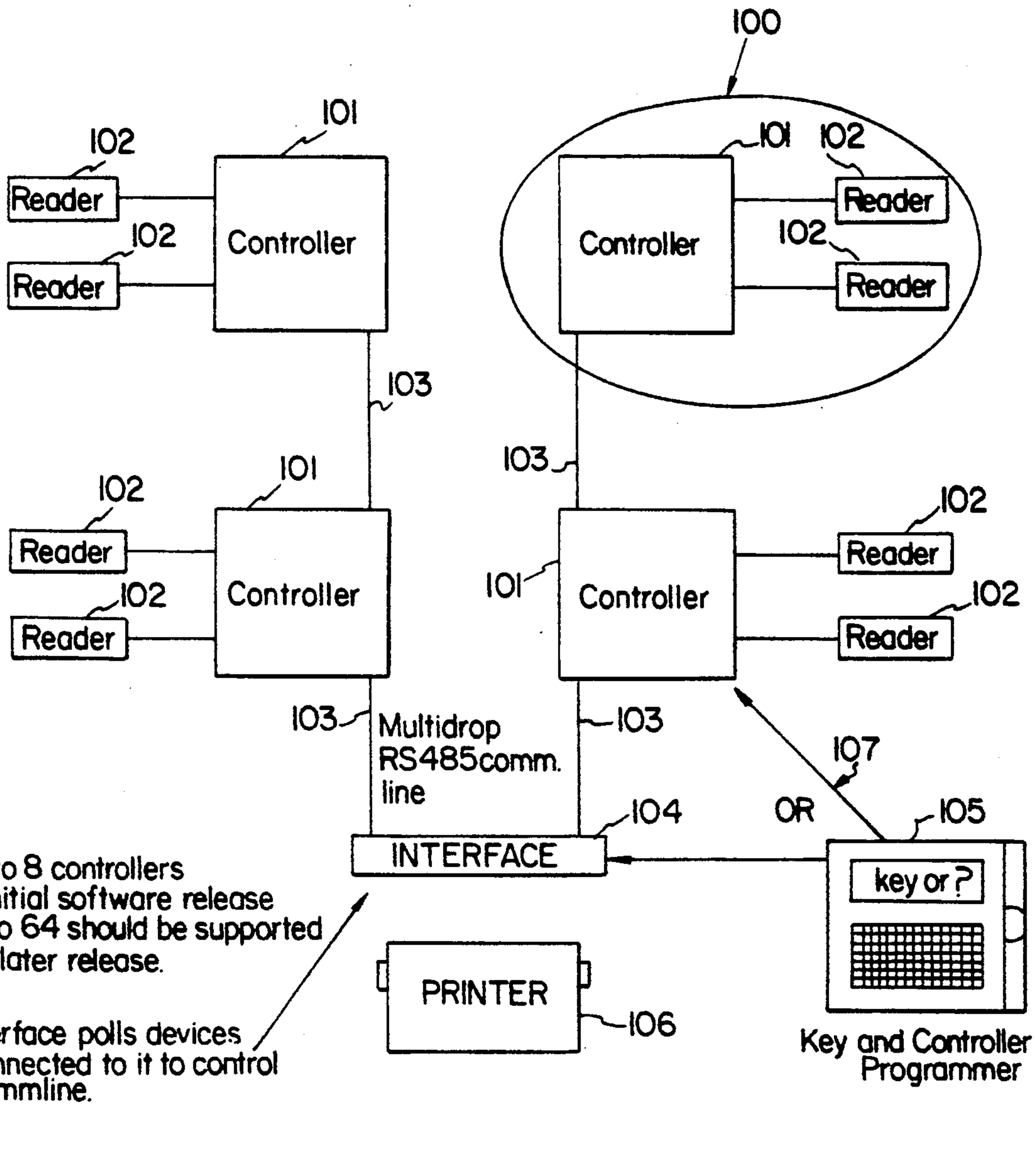
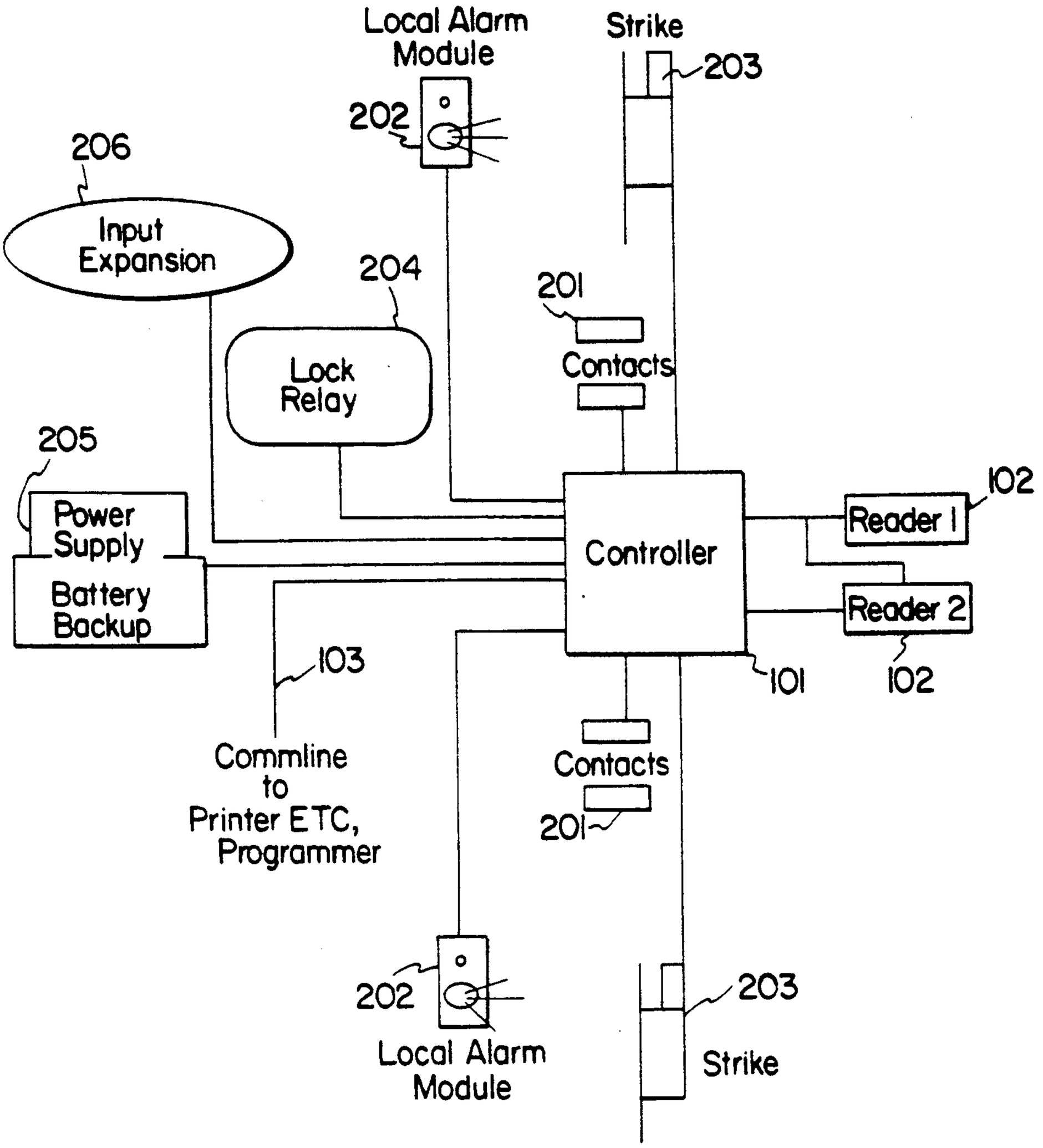

100
101
102
Reader
Controller
103
Multidrop
RS485comm.
line
107
OR
104
105
INTERFACE
key or ?
PRINTER
106
Up to 8 controllers
In initial software release
up to 64 should be supported
for later release.
Interface polls devices
connected to it to control
commline.
Key and Controller
Programmer

FIG. 2


Local Alarm Module
202
Strike
203
206
Input Expansion
204
Lock Relay
201
Contacts
205
Power Supply
Battery Backup
Controller
Reader 1
102
Reader 2
102
101
103
Commline to Printer ETC, Programmer
Contacts
201
202
Local Alarm Module
203
Strike

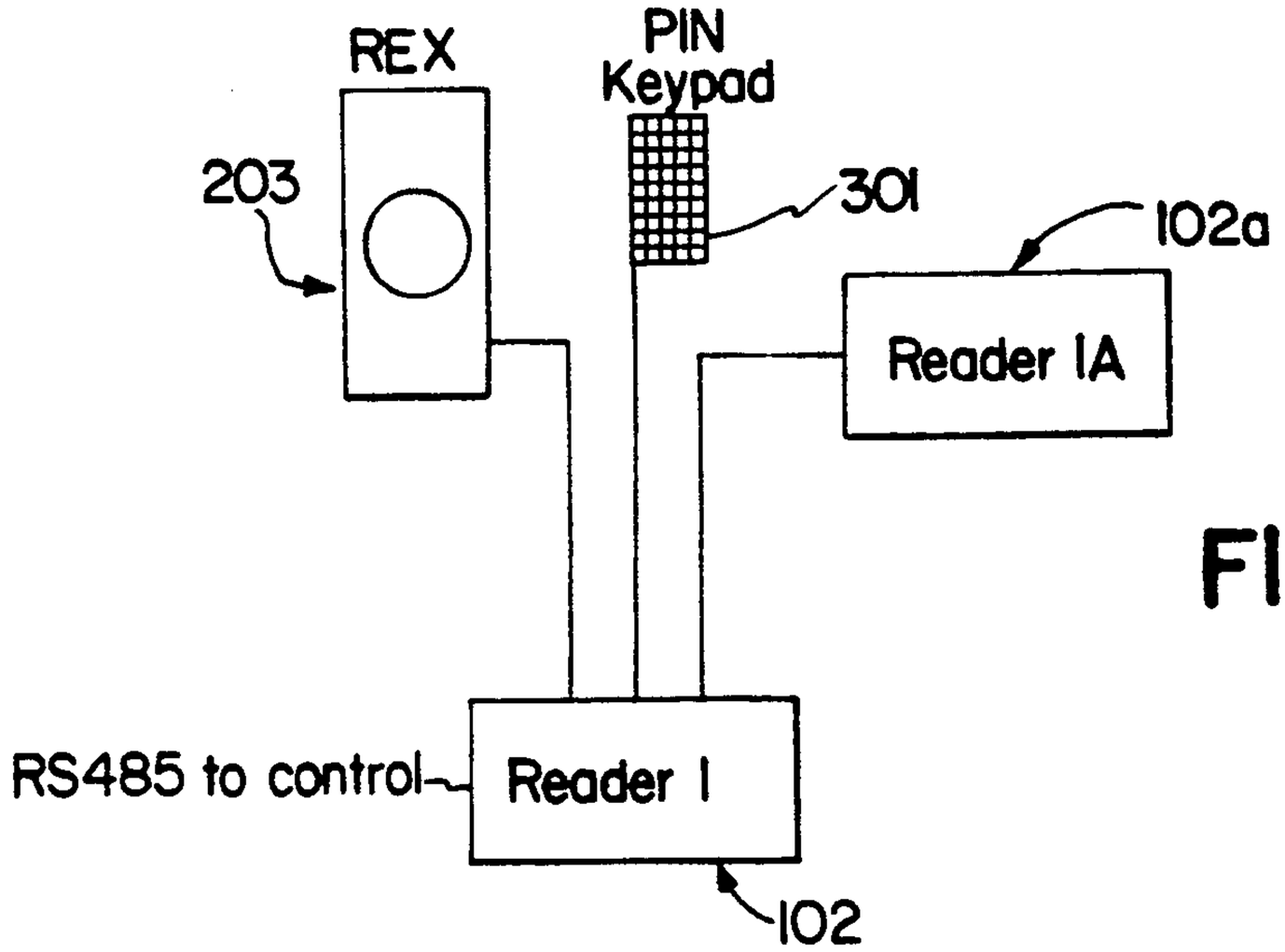

REX
PIN
Keypad
203
301
102a
Reader 1A
RS485 to control
Reader 1
102

FIG. 3

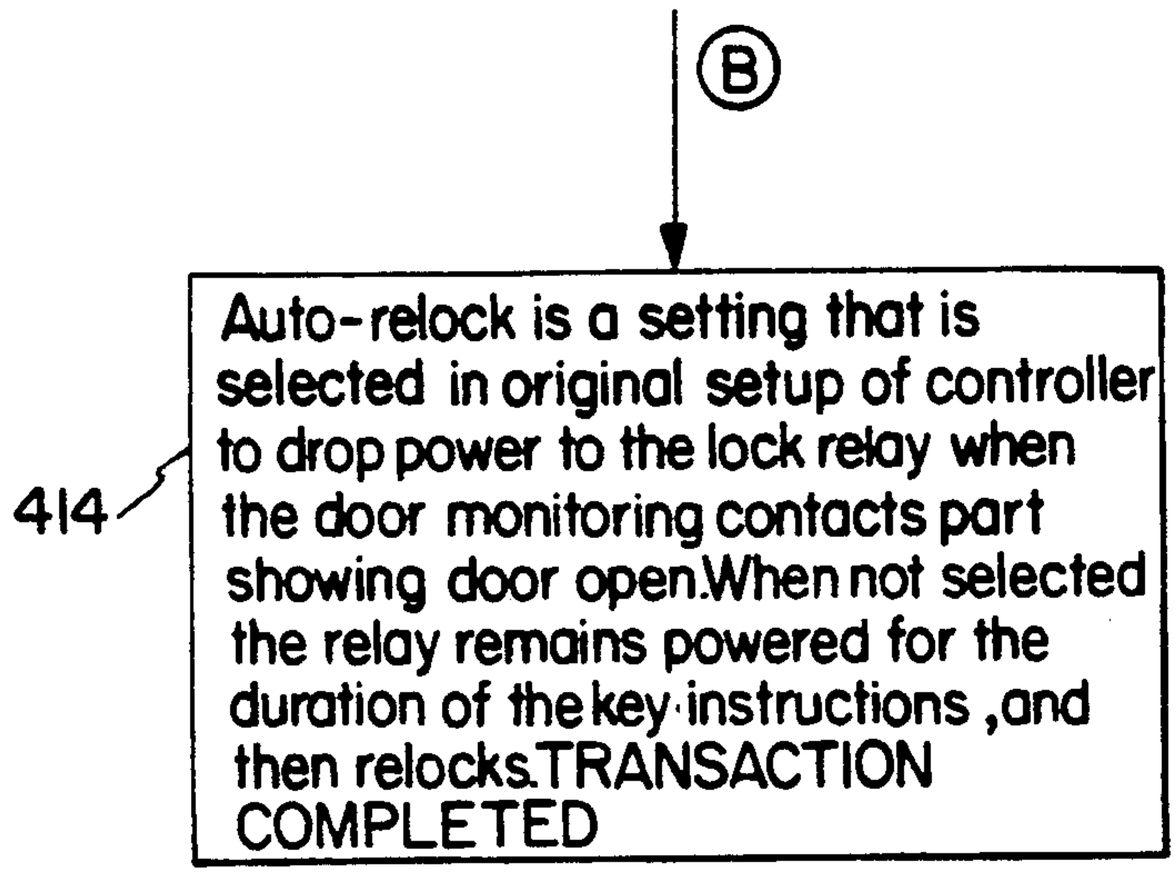

B
414
Auto-relock is a setting that is selected in original setup of controller to drop power to the lock relay when the door monitoring contacts part showing door open.When not selected the relay remains powered for the duration of the key instructions ,and then relocks.TRANSACTION COMPLETED

FIG. 4D

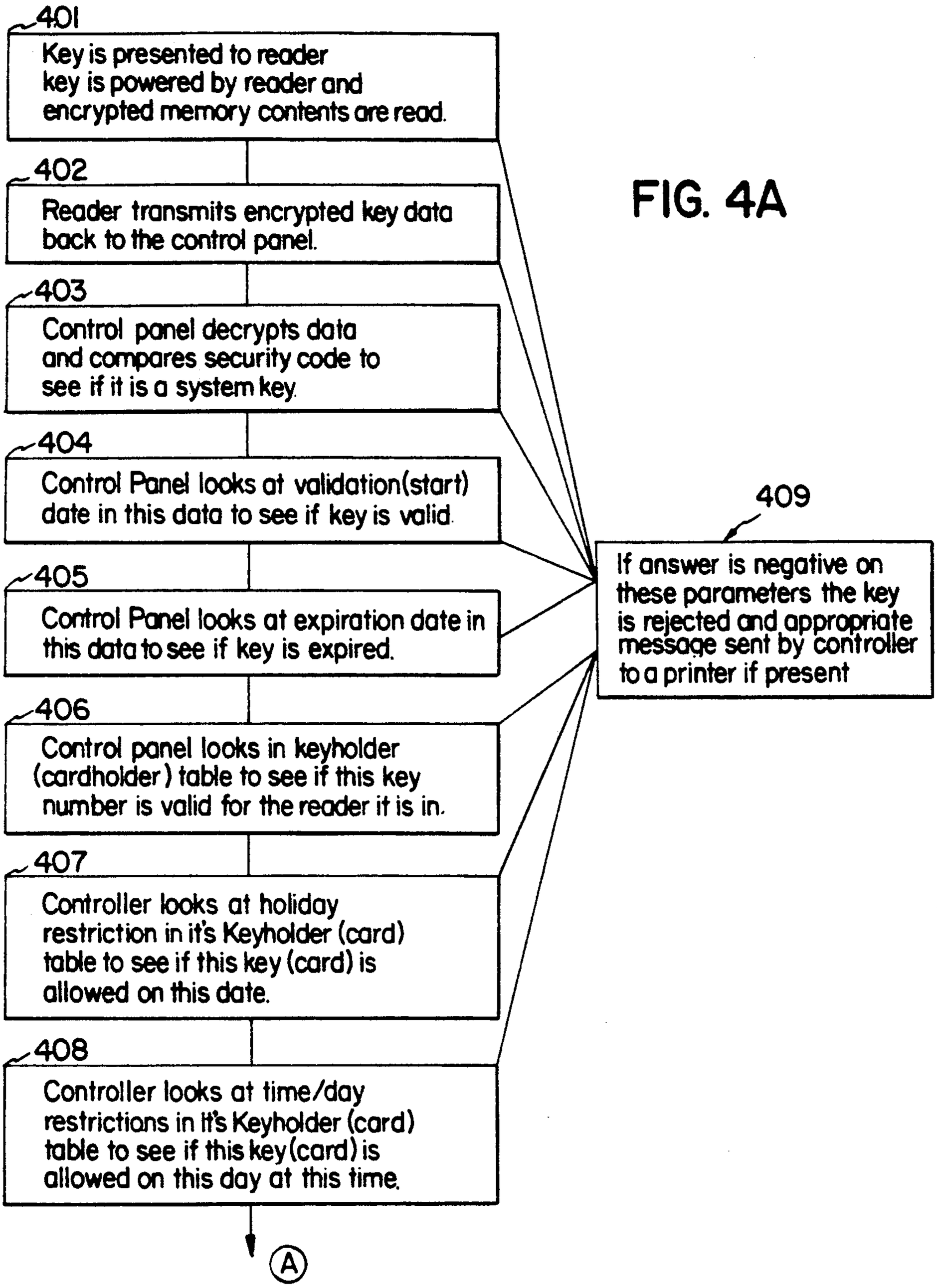

401
Key is presented to reader key is powered by reader and encrypted memory contents are read.
402
Reader transmits encrypted key data back to the control panel.
403
Control panel decrypts data and compares security code to see if it is a system key.
404
Control Panel looks at validation(start) date in this data to see if key is valid.
405
Control Panel looks at expiration date in this data to see if key is expired.
406
Control panel looks in keyholder (cardholder) table to see if this key number is valid for the reader it is in.
407
Controller looks at holiday restriction in it's Keyholder (card) table to see if this key (card) is allowed on this date.
408
Controller looks at time/day restrictions in it's Keyholder (card) table to see if this key (card) is allowed on this day at this time.
A
409
If answer is negative on these parameters the key is rejected and appropriate message sent by controller to a printer if present

FIG. 4A

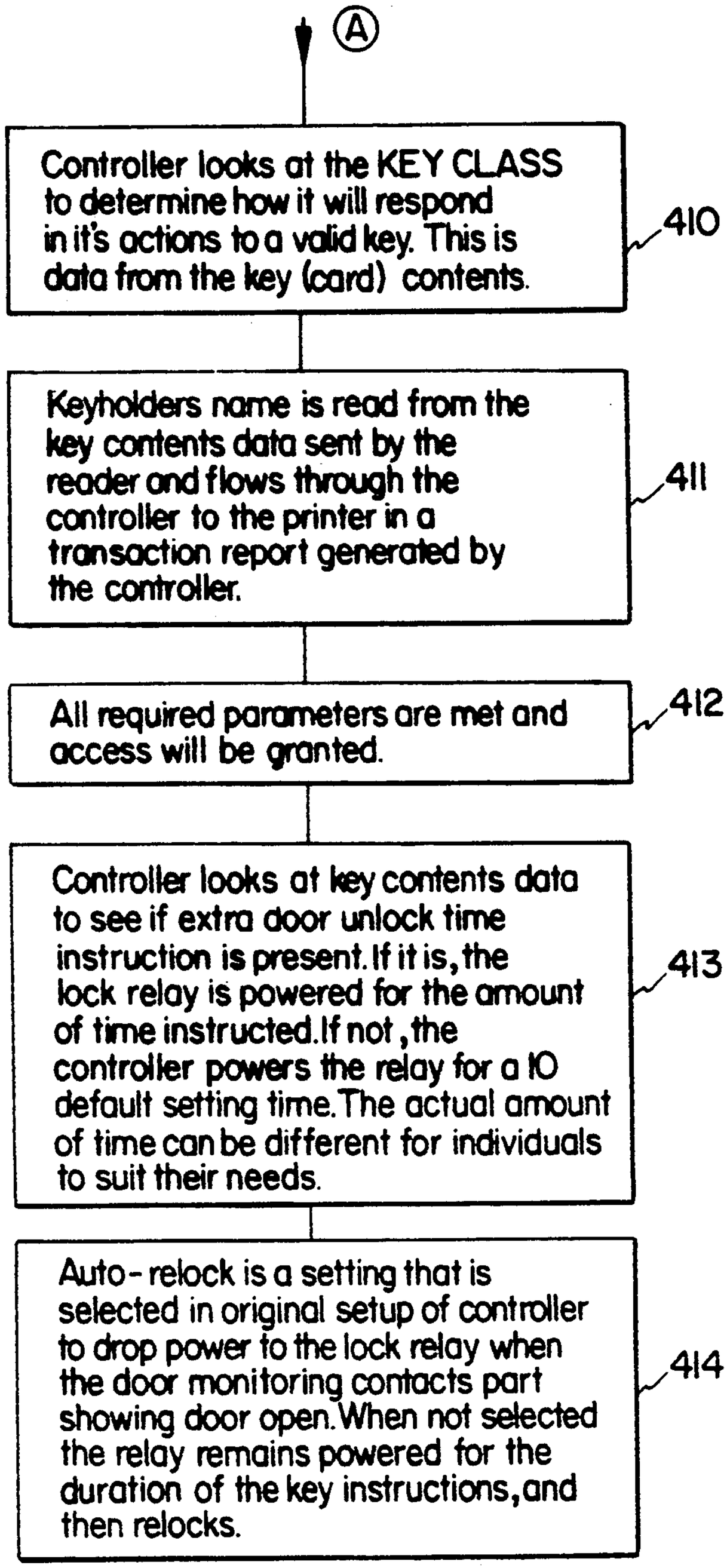

A
Controller looks at the KEY CLASS to determine how it will respond in it's actions to a valid key. This is data from the key (card) contents.
410
Keyholders name is read from the key contents data sent by the reader and flows through the controller to the printer in a transaction report generated by the controller.
411
All required parameters are met and access will be granted.
412
Controller looks at key contents data to see if extra door unlock time instruction is present. If it is, the lock relay is powered for the amount of time instructed. If not, the controller powers the relay for a 10 default setting time. The actual amount of time can be different for individuals to suit their needs.
413
Auto-relock is a setting that is selected in original setup of controller to drop power to the lock relay when the door monitoring contacts part showing door open. When not selected the relay remains powered for the duration of the key instructions, and then relocks.
414

FIG. 4B

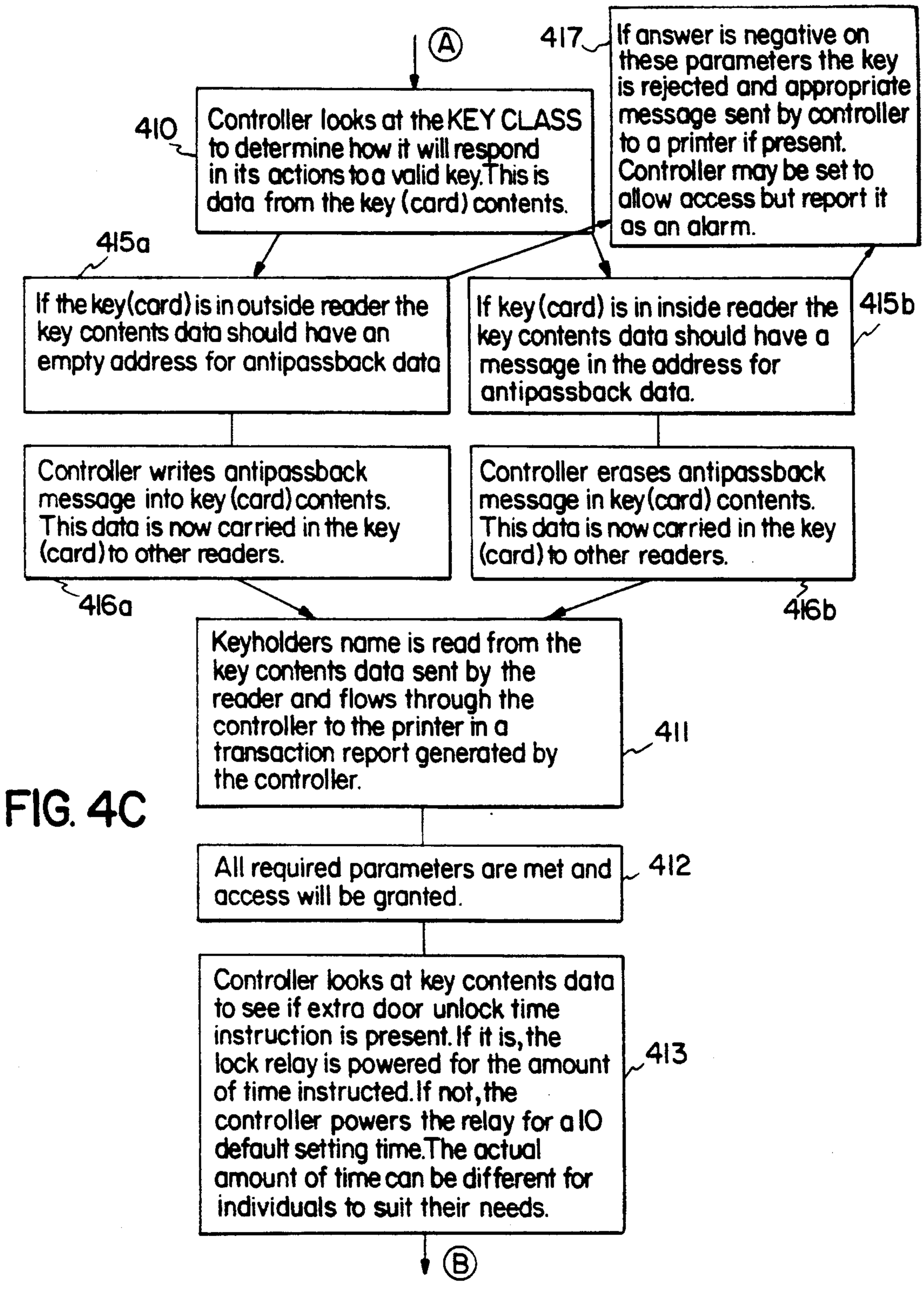

A
417
If answer is negative on these parameters the key is rejected and appropriate message sent by controller to a printer if present. Controller may be set to allow access but report it as an alarm.
410
Controller looks at the KEY CLASS to determine how it will respond in its actions to a valid key. This is data from the key (card) contents.
415a
If the key(card) is in outside reader the key contents data should have an empty address for antipassback data
If key (card) is in inside reader the key contents data should have a message in the address for antipassback data.
415b
Controller writes antipassback message into key (card) contents. This data is now carried in the key (card) to other readers.
Controller erases antipassback message in key(card) contents. This data is now carried in the key (card) to other readers.
416a
416b
Keyholders name is read from the key contents data sent by the reader and flows through the controller to the printer in a transaction report generated by the controller.
411
All required parameters are met and access will be granted.
412
Controller looks at key contents data to see if extra door unlock time instruction is present. If it is, the lock relay is powered for the amount of time instructed. If not, the controller powers the relay for a 10 default setting time. The actual amount of time can be different for individuals to suit their needs.
413
B

FIG. 4C

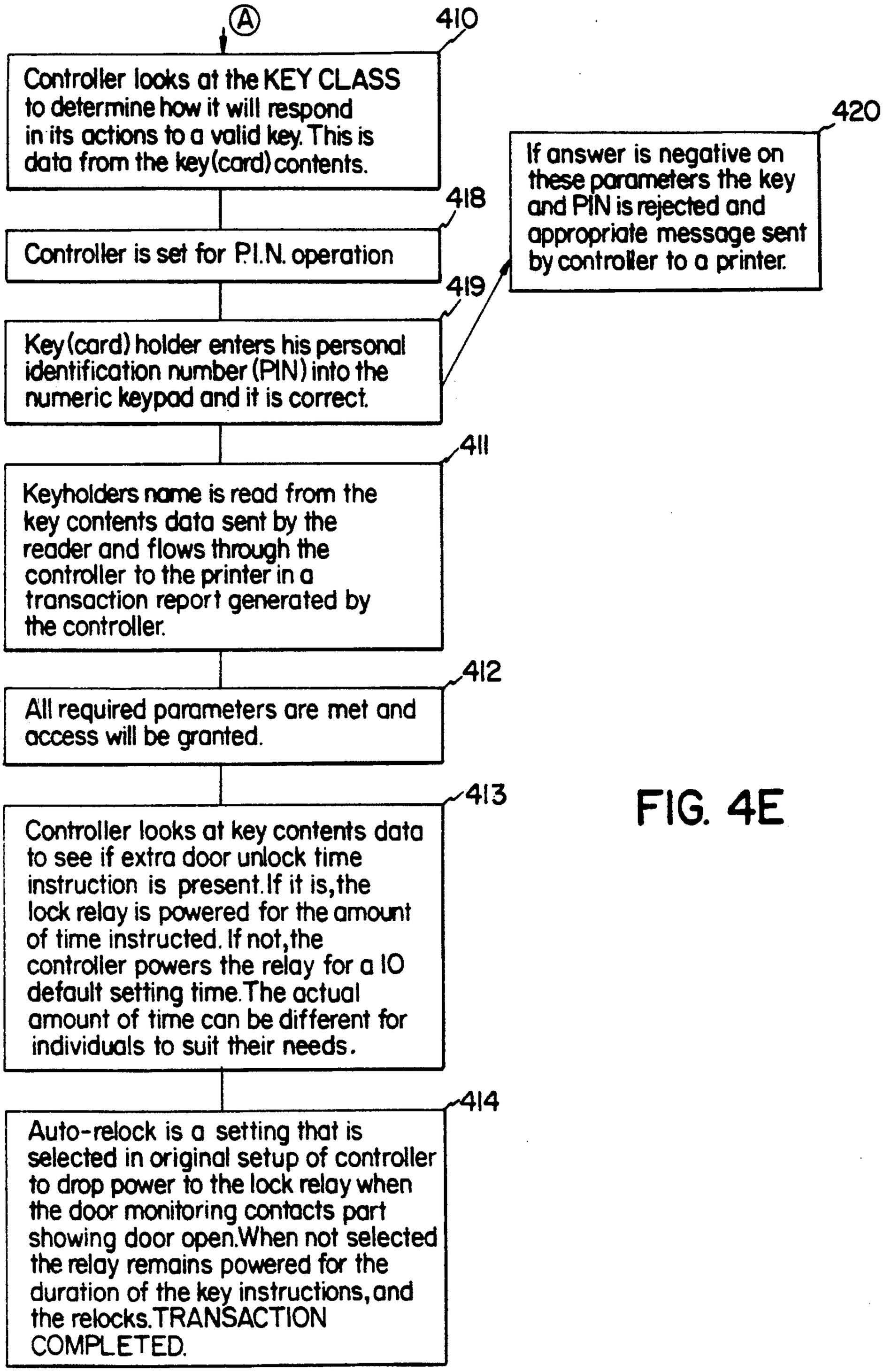
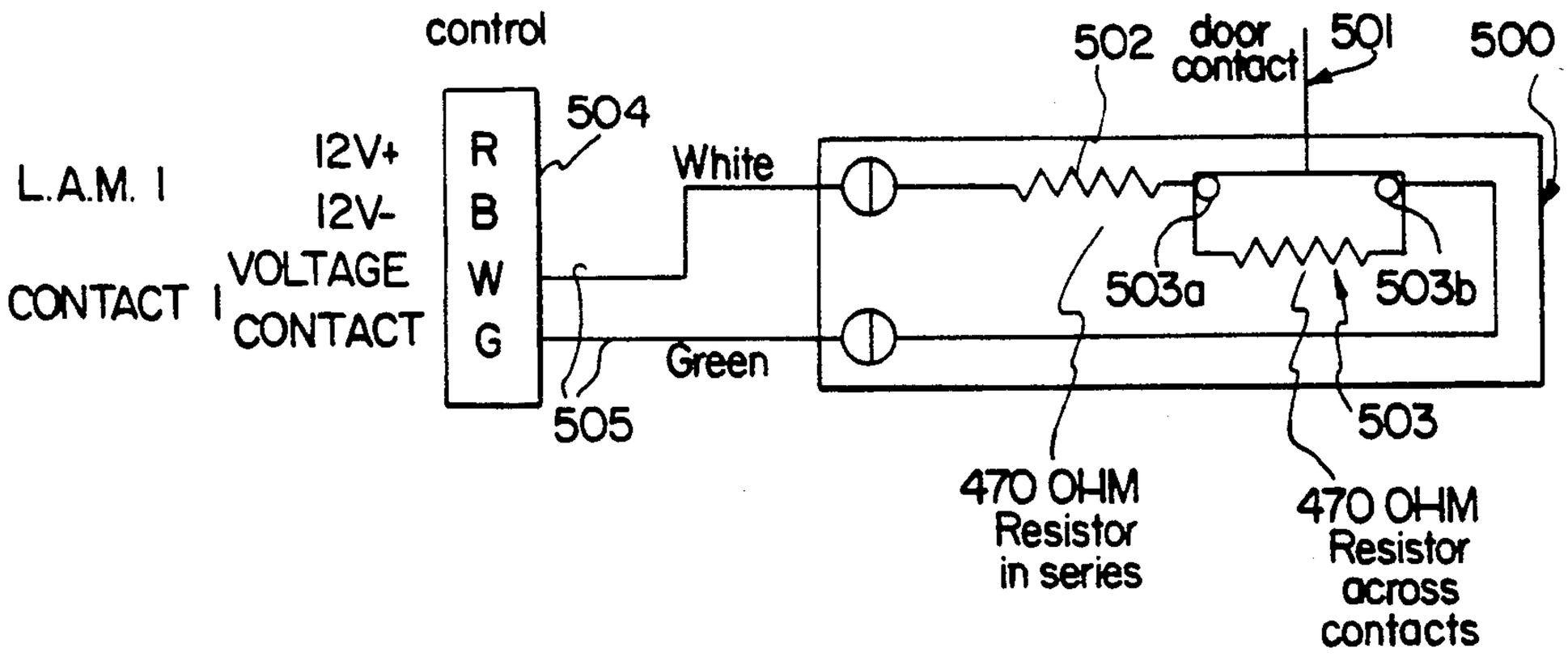

A
410
Controller looks at the KEY CLASS to determine how it will respond in its actions to a valid key. This is data from the key(card) contents.
418
Controller is set for P.I.N. operation
419
Key(card) holder enters his personal identification number (PIN) into the numeric keypad and it is correct.
420
If answer is negative on these parameters the key and PIN is rejected and appropriate message sent by controller to a printer.
411
Keyholders name is read from the key contents data sent by the reader and flows through the controller to the printer in a transaction report generated by the controller.
412
All required parameters are met and access will be granted.
413
Controller looks at key contents data to see if extra door unlock time instruction is present. If it is, the lock relay is powered for the amount of time instructed. If not, the controller powers the relay for a 10 default setting time. The actual amount of time can be different for individuals to suit their needs.
414
Auto-relock is a setting that is selected in original setup of controller to drop power to the lock relay when the door monitoring contacts part showing door open. When not selected the relay remains powered for the duration of the key instructions, and the relocks. TRANSACTION COMPLETED.

FIG. 4E

FIG. 5


control
L.A.M. I
CONTACT I
12V+
12V-
VOLTAGE CONTACT
R
B
W
G
504
505
White
Green
502
door contact
501
500
503a
503b
503
470 OHM Resistor in series
470 OHM Resistor across contacts

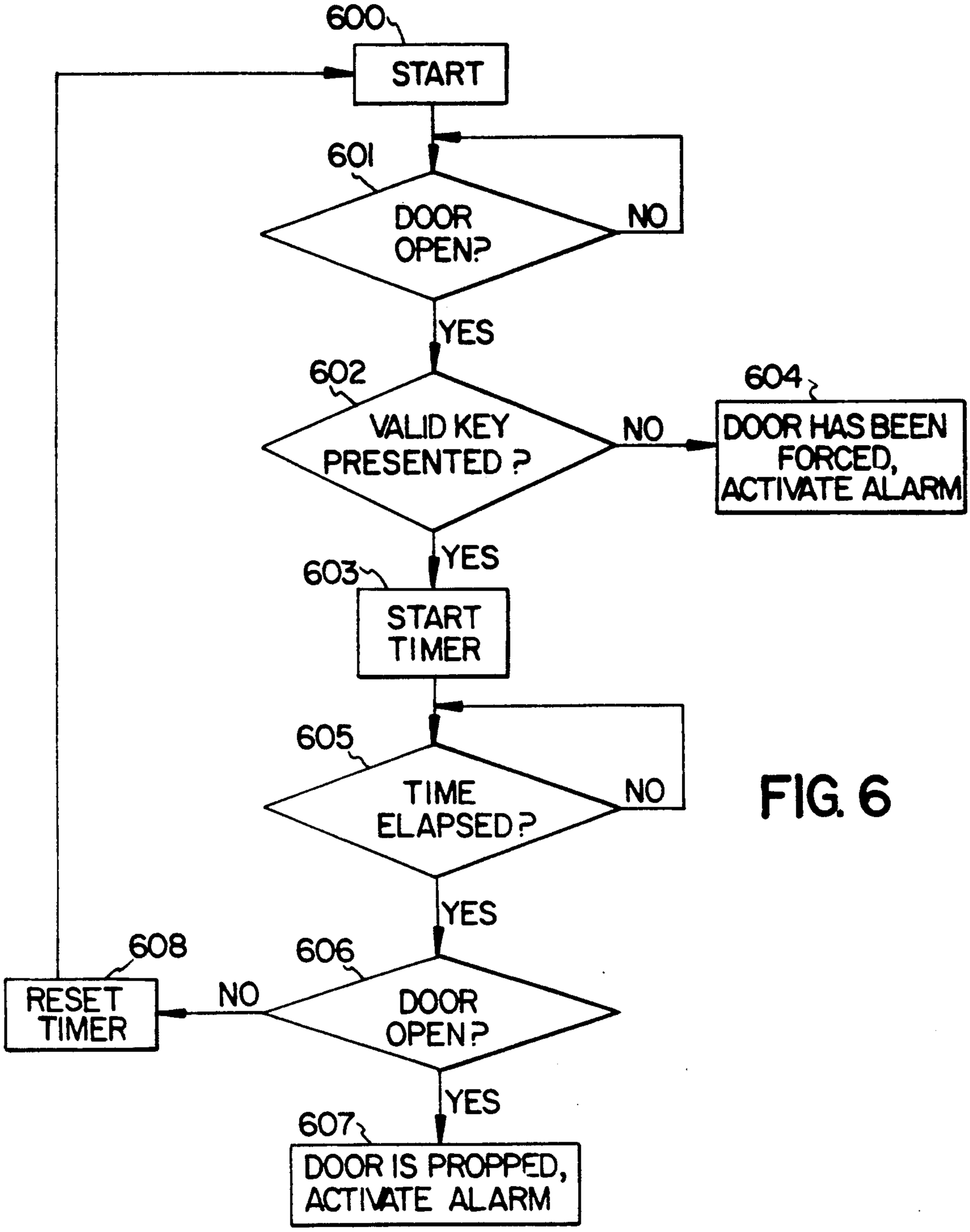

600
START
601
DOOR OPEN?
NO
YES
602
VALID KEY PRESENTED ?
NO
604
DOOR HAS BEEN FORCED, ACTIVATE ALARM
YES
603
START TIMER
605
TIME ELAPSED?
NO
YES
608
606
RESET TIMER
NO
DOOR OPEN?
YES
607
DOOR IS PROPPED, ACTIVATE ALARM

FIG. 6

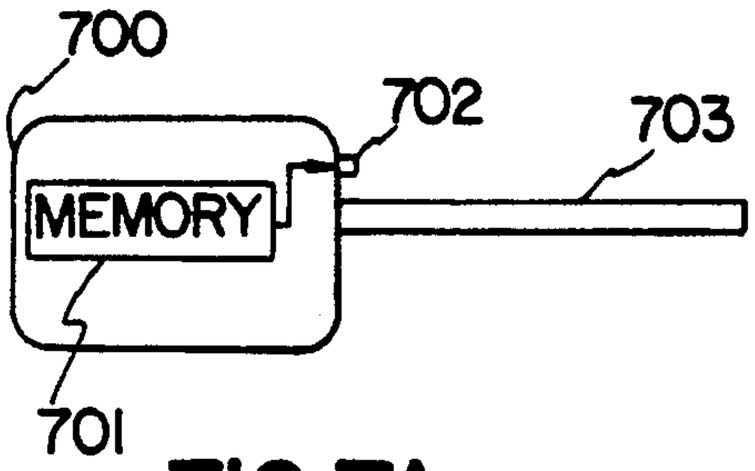


FIG. 7A

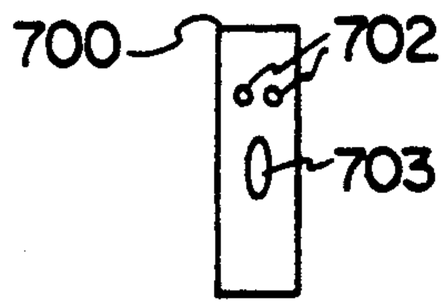


FIG. 7B

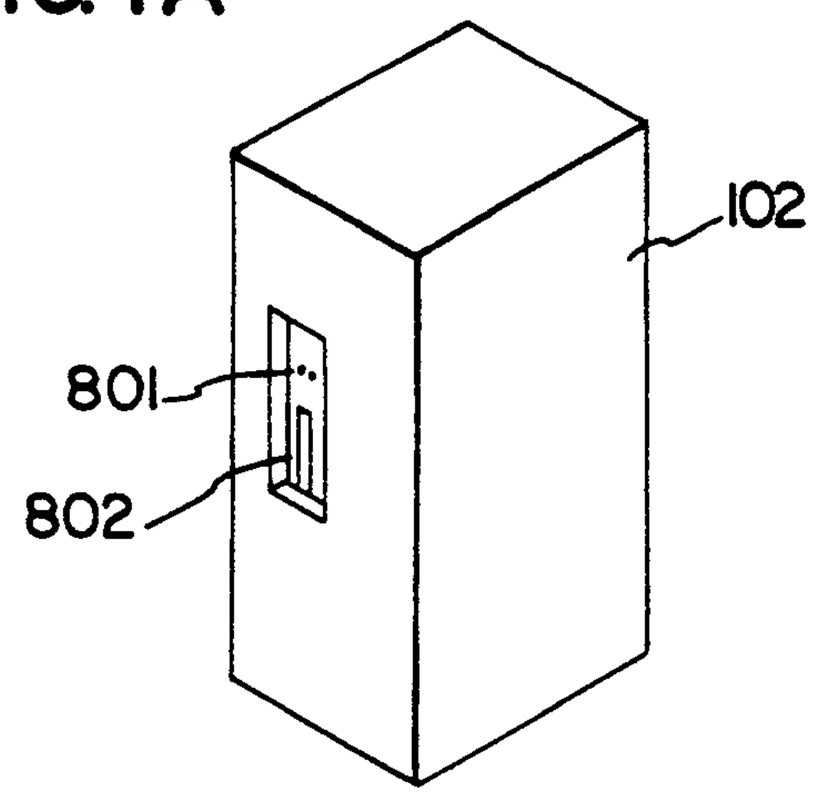


FIG. 8

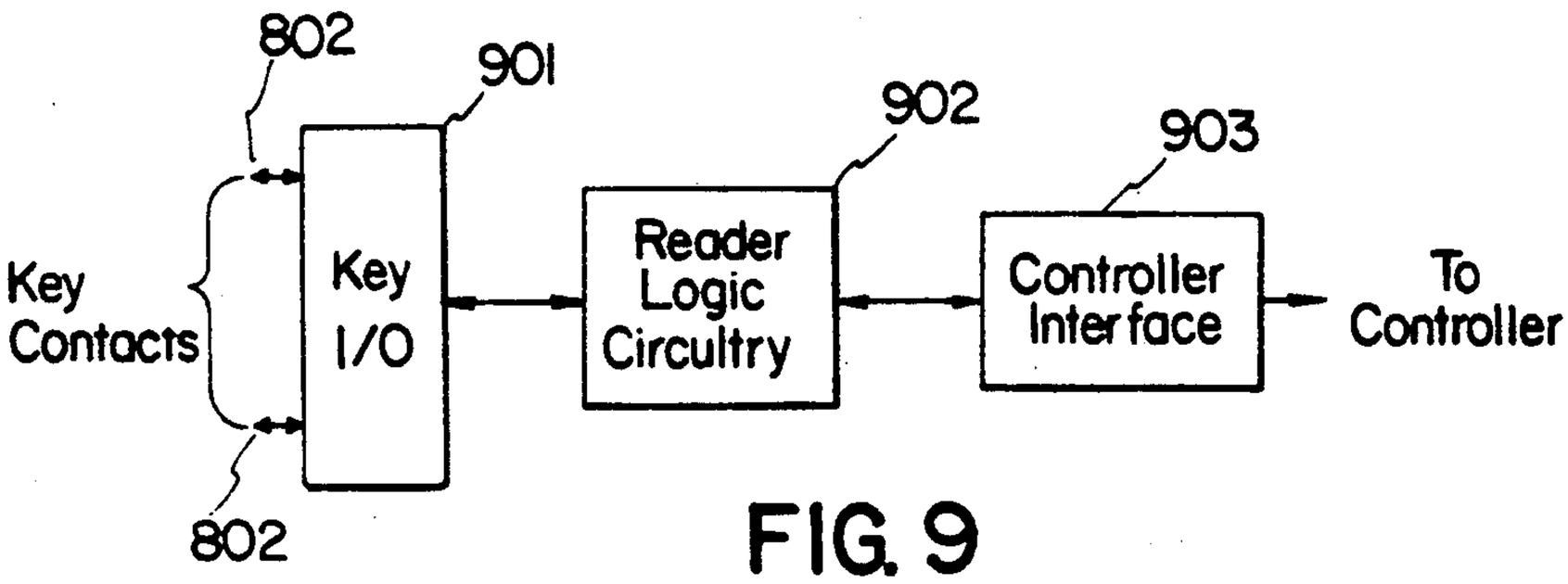


FIG. 9

SECURITY SYSTEM WITH SECURITY ACCESS DATABASE DISTRIBUTED AMONG INDIVIDUAL ACCESS DEVICES

This is a continuation of application Ser. No. 537,724, filed Jun. 14, 1990 now abandoned.

BACKGROUND OF THE INVENTION

1. Field of the Invention

This invention relates generally to microprocessor based security systems, and more particularly to electronic security systems in which a security code is electronically read from a key or access card.

BACKGROUND AND PRIOR ART

Electronic security systems in which a lock and a key are each provided with a memory device having security or ID codes stored therein are known in the art, see e.g. U.S. Pat. Nos. 4,697,171, 4,738,334, 4,438,426 and 4,789,859.

Presently known electronic security systems are restricted in terms of keyholder-specific response features, and the impact of lost keys on system integrity. For example, a conventional electronic key contains a security or ID code stored in memory which corresponds to an ID code stored in the memory of the lock control mechanism. In a security system for a building accommodating hundreds or even thousands of employees, the loss of a single key is particularly burdensome. Typically, the lock controller memory is limited by size and cost considerations, so that the number of different codes capable of being stored is also limited to less than the number of keys needed. The loss of a key may thus necessitate the replacement or reprogramming of hundreds of keys which have the same ID code as the lost key, since the code must be changed in the controller memory to ensure system integrity.

In addition, conventional electronic door locks operate by powering a lock relay for a predetermined number of seconds after a valid key has been presented, during which time the door must be opened by the keyholder. This is particularly inconvenient for handicapped or aged individuals who may not be physically able to gain access in the allotted time. On the other hand, security considerations require that a door not remain unlocked for too long a time period, which would enable an unauthorized person to enter immediately after a valid keyholder has passed through.

In very large buildings such as shopping malls, in which there are a great number of entrances, exits, emergency exits, and freight entrances, there exists the possibility that a particular access door will be overlooked by security personnel responsible for unlocking the facility at the start of the business day and locking up at night. Thus, potentially dangerous situations may arise where a fire or emergency exit has not been unlocked, or conversely a side entrance or exit may be left unlocked overnight.

Another concern is the possibility of wrongdoing on the part of personnel. For instance, an unauthorized person may gain access to a high security building by using an employee's key or electronic card which has been obtained from an employee already in the building by "passing back" of the key or card to the unauthorized person under a door or through a window.

Another potential problem exists with respect to the issuance of visitor keys or cards to temporary persons

such as visitors and service personnel, who may fail to return the visitor key upon leaving the building.

SUMMARY OF THE INVENTION

The present invention overcomes the problems noted above by providing a security system in which a key or card is provided with a memory having stored therein specific coded data and selected command instructions, and in which a controller is provided for controlling the access of a keyholder to a location including a reader for reading the coded data and command instructions from the key or card, determining the validity of the key based on the content of the coded data read from the key memory, allowing access to the location upon the determination of the key to be valid, and responding to the command instructions read from the valid key. The command instructions can be custom programmed into the key based on the needs of the particular holder, such as a command to increase the amount of time that a door relay remains activated to allow a handicapped person enough time to enter, or a command to override the requirement for a keyholder to enter a personal identification number (PIN) on a key pad in addition to presenting a key or card to a reader device.

The present invention further provides a security system in which validation time data is stored in a key memory, and is compared with current time and date at the controller to determine whether the key is still valid.

The present invention further provides a security system including the capability for writing coded data into the memory of a key presented to a reader device "on the fly" so as to write the location of the reader into the key memory to control the subsequent use thereof.

The present invention further provides a security system having the capability of determining whether a door has been forced or propped open and activating an alarm in response to such a condition.

The invention further provides a method of controlling access to a location comprising the steps of storing coded data and commands in the memory of a key, reading the coded data and commands from the key memory, and determining the validity of the key based on the coded data read from the memory, and allowing access to the location and responding to the commands when the key is determined to be valid.

BRIEF DESCRIPTION OF THE DRAWING

The present invention will become more fully understood from the detailed description given hereinbelow and the accompanying drawings which are given by way of illustration only, and are not limitative of the present invention, and wherein:

FIG. **1** is a block diagram of the basic configuration of an electronic security system according to one preferred embodiment of the present invention;

FIG. **2** is a detailed block diagram of the components of the individual controllers of FIG. **1**;

FIG. **3** is a block diagram illustrating the use of a master/slave card reader configuration;

FIGS. **4A–4E** are flowcharts explaining the general operations of the controller;

FIG. **5** is a schematic diagram of a door sensor circuit according to one preferred embodiment of the present invention;

FIG. **6** is a flowchart for explaining the operation of door position sensing;

FIGS. 7A and 7B are side and end views, respectively, of a key device according to one embodiment of the present invention;

FIG. 8 is a conceptual perspective view of a key reader device of one preferred embodiment according to the present invention; and

FIG. 9 is a block diagram illustrating the components of the reader device of FIG. 8.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

FIG. 1 is a block diagram of the basic configuration of one preferred embodiment according to the present invention.

The basic unit **100** of the present security system includes a controller **101** containing standard logic circuitry including a microprocessor, ROM, RAM, a clock oscillator, and input/output interfaces. An individual controller **101** may support up to two electronic key or card reader devices **102**. Individual controllers may be connected by communication lines **103** and networked to a master key and controller programmer unit **105** via an interface circuit **104**. A printer **106** can be connected to the interface unit **104** to provide data printouts. The programmer unit **105** can also be connected to each controller **101** individually through a separate communication line **107**. In operation, controller programmer **105** polls the individual controller devices **101** through interface **104** to coordinate communication priority among controllers.

FIG. 7A is a side view of a key device according to one preferred embodiment of the present invention. Key body **700** includes a memory **701**, which may be an electrically erasable programmable read only memory (EEPROM) and which is connected to external contact terminals **702**. The key further includes a key blade **703**. In the preferred embodiment, key blade **703** does not have any mechanical key cuts but is merely used to guide the key into a reader device. However, key cuts may be used in addition to the electronic security code. FIG. 7B is an end view of the key **700**.

FIG. 8 is a perspective view of a reader device **102**. Contact terminals **801** make contact with terminals **702** on the key body when key blade **703** is inserted into keyway **802**.

FIG. 9 is a block diagram of the components of reader device **102**. Key input/output interface **901** transmits data and command instructions from memory **701** to the reader logic circuitry **902**, which typically includes a microprocessor, RAM and buffer memories. Data is communicated to the controller **101** via a controller interface unit **903**.

FIG. 2 is a detailed block diagram of the configuration of the basic control unit **100**. Besides reader device **102**, the controller **101** is further connected to contact sensors **201** for sensing the condition of doors associated with reader devices **102**, and is further connected to local alarm modules **202**, which are activated upon the detection of a door to be either forced or propped open. Rex switch **203** (FIG. 3) may be provided at the interior side of the door, which send a request to exit (REX) signal to the controller when actuated by a user wishing to exit from the controlled access location. The controller **101** is connected to a lock relay switch **204** which activates a relay to unlock a door when a valid key is presented to reader **102**. Controller **101** is also provided with a battery backed-up power supply **205**, and also contains an expansion port **206** which is connectable to additional peripheral devices for future system upgrading.

FIG. 3 illustrates another preferred embodiment in which a master reader **102** is connected to a slave reader **102***a*, as well as to a request to exit (REX) switch **203** and a PIN keypad **301**. By connecting a slave reader **102***a* directly to a master reader **102**, the number of wire connections of the system may be significantly reduced. The PIN keypad can be used for entering a keyholder's personal identification number in addition to presenting his or her key at the reader device **102** for increased security. The user's PIN is stored in the key memory **701** and is compared with a PIN entered through the keypad **301** to determine whether the keyholder is authorized to possess the key.

The operation of the system will now be described with reference to FIGS. **4A–4E**.

Among the data stored in the key memory **701** is a security or ID code corresponding to an ID code stored in a memory table within the controller **101**, a key validation start date and expiration date, a keyholder PIN, the keyholder's name, a key identification number, and various command instructions which modify the controller's response to the presentation of a valid key.

At step **401**, the key **700** is presented to the reader **102**, and the data in memory **701** is read by the reader logic circuitry. At step **402**, the reader transmits the read data to the controller **101** via the controller interface **903**. At step **403**, the controller **101** decrypts the encrypted data and compares the security code against the security code table stored in its memory. If the security code read from the key does not correspond to any of the codes in the table, processing advances to step **409** at which the key is rejected and an appropriate message is sent by the controller to printer **106**, if connected to the system.

If the security code from the key corresponds to a code in the table, processing proceeds to step **404** at which the validation start date read from the key is compared with the current date as read from the internal system clock. If the current date is subsequent to the validation date, processing proceeds to step **405** at which the expiration date is compared with the current date. At step **406**, the controller compares a key identification number against a table of key identification numbers which are valid for the specific reader to which the key is presented. At steps **407** and **408**, the key identification number is compared against a time restriction table to determine whether the key is valid for that particular day and time or holiday if applicable. If the results of any of the comparisons is negative, processing immediately advances to step **409** in which the key is rejected, and no further action is taken.

Processing continues to step **410** as shown in FIG. **4B**. In this step, the data read from the key memory is checked to determine the key class. The key class corresponds to a command instruction which will be executed by the controller if the key is determined to be valid. For example, a Class **1** key would denote a regular key having no program effect on the controller, a Class **2** key denotes that the keyholder is handicapped and instructs the controller to override PIN keypad entry verification and an auto-relock feature described below. A Class **3** key denotes that the keyholder is management and instructs the controller to override antipassback features and PIN keypad entry verification. A Class **4** key is not presented to unlock a door but instructs the controller to override any automatic time

controlled lock operation, for example, in which the lobby doors of a building automatically unlock in the morning and lock in the evening. The Class **4** key is intended to prevent the automatic unlocking of doors in the event of an emergency such as a power outage or inclement weather conditions, in which case the key would be inserted into the appropriate reader by security personnel. A Class **8** key denotes a key instructing the controller to reset its automatic lock time control when overridden by a Class **4** key.

At step **411**, the keyholder's name is read from the key memory data, which can be utilized in a transaction report printout showing the name, location, and time of access. At step **412**, all required key parameters are determined to be met and access will be allowed. At step **413**, the controller looks for an extra door unlock time instruction. If the key contains such an instruction, the door lock relay is powered for the amount of time indicated in the instruction. If no such command is present, the controller powers the lock relay for a default time period such as 10 seconds. The specific unlock time can be varied according to the needs of the particular keyholder.

At step **414**, the controller monitors the door condition and immediately deactivates the lock relay upon sensing that the door has been opened, so that the door does not remain unlocked after access has been gained but is automatically relocked upon closure. If the controller has determined the key to be a Class **2** or handicapped key, the auto-relock feature will be overridden and the relay will remain powered for the amount of time read at step **413**.

FIG. **4C** is a flowchart explaining the optional antipassback feature. The antipassback feature prevents a keyholder from entering a location and passing his or her key back to a potentially unauthorized person. The antipassback feature requires the use of a reader device at both the exterior and interior door locations.

Identical steps of FIG. **4C** are numbered the same as those of FIG. **4B** and will not be repeated. If the controller has determined the reader device at which the key is presented to be an exterior reader, processing proceeds to steps **415***a* and **416***a*. At step **415***a*, the key memory antipassback data address is checked to determine whether it is empty. If the antipassback memory location contains a message, this denotes that the key was last used in an outside reader and therefore has been passed back to another party, and accordingly processing proceeds to step **417** at which the key is rejected and appropriate action is taken by the controller, such as activating an alarm or sending a message to the master programmer. If the antipassback location is empty, processing proceeds to step **416***a* in which the controller writes an antipassback message into the antipassback memory address.

If the reader device at which the key is presented is determined to be an inside reader, the controller advances to step **415***b* in which the antipassback memory location is checked for the presence of an antipassback message. If the antipassback location is empty, it is determined that the key was previously used at an inside reader and processing advances to step **417** at which the key is rejected and appropriate action taken. If the proper antipassback message is present in the key memory location, processing advances to step **416***b* at which the antipassback message is erased. The remaining steps **411** to **413** and **414** as shown in FIG. **4D** are identical to FIG. **4B**.

The same processing steps can be used when a specific sequence of operation is required, such as the sequential unlocking or locking of a plurality of doors in a large building or shopping mall. In such case, the key memory is checked at a specific address to determine whether the key has been presented to the required reader before being inserted into the current reader. If so, the data is replaced by writing new data identifying the current reader into the key memory.

FIG. **4E** illustrates an alternative embodiment in which a PIN verification is carried out. At step **418**, the controller determines that a PIN is required. At step **419**, the controller waits for the keyholder to enter his or her PIN via the numeric keypad. If the PIN is correct, processing advances to steps **411–414**. If the PIN is incorrect, processing advances to step **420** in which the key is rejected, and further appropriate action is taken.

It is to be noted that the antipassback and PIN processing features can be utilized together as well as individually as described above.

FIG. **5** is a schematic block diagram illustrating one preferred embodiment of a door sensor **500** for determining the condition of a door, including a door contact switch **501**, a resistor **502** in series with the door contact switch **501**, and a resistor **503** in parallel with switch **501**. The sensor **500** is connected to a controller input terminal **504** via a pair of conductors **505**. The opening of a door causes contact switch **501** to make contact with terminals **503***a* and **503***b*, thus shorting out resistor **503** from the remainder of the circuit, causing a higher voltage to be applied to the controller via terminal **504** which indicates that the door is open. Conversely, upon door closure switch **501** breaks contact with terminals **503***a* and **503***b* causing resistor **503** to be in series with resistor **502** thereby reducing the voltage applied to the controller logic terminal **504**.

The door sensing operation will be described with reference to the flowchart of FIG. **6**. At step **600**, the controller is powered up and processing advances to step **601** at which the controller periodically monitors the voltage appearing at terminal **504** to determine whether the door has been opened. Upon detecting that the door has been opened, processing advances to step **602** at which the controller determines whether a valid key has been presented at the corresponding key reader, by checking whether the main processing routine has advanced to step **412**. If a valid key has been presented, processing advances to step **603** at which a timer is started. If a valid key has not been presented to the reader, processing advances to step **604** at which it is determined that the door has been forced open, and an alarm is activated. At step **605**, the controller determines whether a predetermined time has elapsed since the door has been validly opened. After such predetermined time, processing advances to step **606** at which it is detected whether the door is still open. If the result of step **606** is positive, processing advances to step **607** at which it is determined that the door is propped open, and an appropriate alarm is activated. If the result of step **606** is negative, the timer is reset at step **608** and processing returns to step **600** to repeat the door monitoring procedure.

The invention being thus described, it will be apparent to those skilled in the art that the same may be varied in many ways without departing from the spirit and scope of the invention. Any and all such modifications are intended to be included within the scope of the following claims.

What is claimed is:

1. A security system, comprising:

key means for gaining access to a location, including a memory having stored therein specific coded data including a security code and additional validation data specific to said key means, and selected command instructions related to access requirements specific to an authorized keyholder assigned to said key means; and

controller means for controlling access to said location, including

means for reading said coded data and command instructions from said key means,

means for determining the validity of said key means based on the content of the coded data read from said key means,

means for allowing access to said location upon determining said key means to be valid, and

means for responding to command instructions read from a key means determined to be valid in order to provide a mode of access in accordance with said access requirements.

2. The security system of claim 1, wherein said controller means further includes means for writing coded data into the memory of said key means to control the subsequent use thereof.

3. The security system of claim 2, wherein the coded data written into said key means memory comprises data identifying the location at which said key means has been presented, said controller means further including means for determining a specific operating sequence of said key means by location, said validity determining means determining said key means to be invalid if presented to a location out of said sequence.

4. The security system of claim 2, wherein said means for reading comprises a key means reader at both an entrance and an exit of said location, said coded data written into the memory of said key means including information identifying the reader at which said key means was last used, said key means being determined invalid if said key means is presented to the same reader twice in succession.

5. The security system of claim 4, further comprising means for altering reader identifying information previously stored in said key means memory when said key means is determined to be valid.

6. The security system of claim 1, wherein said additional validation data includes a validation start date and expiration date, said controller means further including a memory and a clock, said key means being determined valid if said security code corresponds to a previously stored security code in said controller means memory and if the current date determined from said clock is within the period defined by said start and expiration dates.

7. The security system of claim 1, wherein said means for allowing access to said location includes means for deactivating a lock mechanism for a predetermined time period, said command instructions including a time extension command for altering the amount of time that said lock mechanism is deactivated.

8. The security system of claim 1, further comprising personal identification number (PIN) entry means for transmitting a PIN entered by a key means holder to said controller means, said entered PIN being compared with a previously stored PIN read from said key means memory as part of said validity determination, said command instructions including a PIN override instruction for causing said validity determining means to bypass said PIN comparison in determining whether said key means is valid.

9. The security system of claim 1, wherein said controller means further comprises means for automatically time controlling access to said location, said command instructions including an instruction for overriding said automatic time control means.

10. The security system of claim 1, wherein said specific coded data stored in said key means memory includes the name of an authorized holder of said key means.

11. The security system of claim 1, wherein said means for allowing access to said location comprises means for powering a lock relay to open a door, said controller means further including means for detecting whether said door is propped open or forced, and alarm means for generating an alarm when said door is detected to be propped open or forced.

12. A method of controlling access to a location, comprising the steps of:

storing coded data including a security code and additional validation data and commands related to access requirements specific to an authorized keyholder, in a memory of a key, said additional validation data being specific to said key means;

reading said coded data and commands from said memory; and

determining the validity of said key based on the coded data read from said memory and allowing access to said location and responding to said commands to provide a mode of access in accordance with said access requirements when the key is determined to be valid.

13. The method of claim 12, further including the step of writing data into a valid key to control the subsequent use of the key after access has been allowed.

14. The method of claim 12, further including the step of altering the data stored in said key to control the subsequent use of the key after access has been allowed.

15. The security system of claim 7, wherein said time extension command causes said means for deactivating to increase the amount of time that said lock mechanism is deactivated.

16. A security system, comprising:

a plurality of key means for gaining access to a plurality of locations, each of said plurality of key means including a memory having stored therein coded data specific to said key means and command instructions specific to said key means;

a plurality of controllers interconnected by a communication line to a controller programmer, each of said controllers being positioned at a separate location for controlling access to said separate location, wherein each of said controllers comprises

means for reading coded data from a memory of a key means presented thereto,

a memory table storing a list of codes corresponding to specific key means authorized to have access to the location controlled by said controller,

means for determining the validity of said presented key means by comparing coded data read therefrom with said list of codes in said memory table,

means for allowing access to said location upon determining said presented key means to be valid, and

means for executing command instructions read from said presented key means memory;

wherein said controller programmer polls individual ones of said plurality of controllers for communication therebetween.

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